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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,536	10/24/2003	Jeff Jelinek	87359.1940	6875

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EXAMINER

PRICE, CARL D

ART UNIT	PAPER NUMBER
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3749

DATE MAILED: 03/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/691,536	JELINEK, JEFF	
	<b>Examiner</b>	<b>Art Unit</b>	
	CARL D. PRICE	3749	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01/03/2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,5-11,13-18 and 20 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,5-11,13-18 and 20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### Response to Arguments

Applicant's arguments filed 02/01/2005, with respect to claims 1-3 and 5-9, have been fully considered but they are not persuasive.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues that the prior art references relied on to reject the claims do not show or teach a “burner controller operably connected to the system controller wherein the system controller sends a signal to the burner controller to shut down the burner when the NO<sub>x</sub> emissions in the exhaust conduit are at a first unacceptable level”. The Examiner disagrees for the same reasons stated in the previous office action. To the extent that the extent that the pulsations discussed in Bentz et al are indicative of or related to the concentration of NO<sub>x</sub> (i.e. – the computer opens the FGR damper 77 just enough to reduce NO<sub>x</sub> to the desired level” (see column 8, line 55 - column 6, line 11), Bentz et al teaches that a “computer”, which operates in response to computing the fraction of flue gas recirculated (FGR) by performing a mapping and storing function, “may shut down the boiler”. Therefore, Bentz et al alone discloses and teaches a microprocessor burner controller operably connected to the system controller wherein the system controller sends a signal to the burner controller to shut down the burner. A person having ordinary skill in the art need only look to US005002484 (Lofton et al) and JP 03-194314 which clearly establish the level of ordinary skill in the art such that it is known to use signals generated in a system controller to automatically shut down burner operations in response to signals representing unacceptable operating parameters detected, in order to prevent unsafe or damaging burner operation. Thus, to modify the system controller of Bentz et al to automatically shut down the burner system in response to a predetermined value of sensed NO<sub>x</sub> for the reasons set forth in

**US005539638A KEELER et al** which teaches shutting down combustion operation rather than face high penalties of out-of-compliance operation.

Additionally, the examiner maintains that operating a system controller such as in Bentz et al wherein when a predetermined level of NO<sub>x</sub> is at or above a “first” or “second” level to initiate either an alarm or valve adjustment can be viewed as nothing more than merely a matter of choice in design and/or an obvious engineering design expedient absent the showing of any new of unexpected results produced therefrom.

**Applicant's arguments directed to amended claims 10, 11, 14-18 and 20-22**

Applicant's arguments with respect to claims 10, 11, 14-18 and 20-22 have been considered but are moot in view of the new ground(s) of rejection.

Applicant traverses the various grounds of rejection based on the argued lack of support in Bentz et al of a burner controller operably connected to the system controller wherein the system controller sends a signal to the burner controller to shut down the burner when the NO<sub>x</sub> emissions in the exhaust conduit are at a first unacceptable level. Applicant's attention is directed to the newly discovered prior art reference of **US006530207B2 (Tobo et al)** now relied on to teach this limitation. See below.

**Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1-3, 5-9: Rejected under 35 U.S.C. 103(a)**

Claims 1-3 and 5-9 are rejected under 35 U.S.C. 103(a) as being obvious over **US005511971A (Benz et al)** in view of **US005002484 (LOFTON et al)** (of record) and **US005539638A KEELER et al** (newly cited).

**US005511971A (Benz et al)** shows and discloses a system for a hydrocarbon fired burner comprising:

- an exhaust conduit (54) in fluid communication with a burner (51);
- a recirculation conduit (59) configured to provide at least at times fluid communication between the exhaust conduit and burner inlet;
- an adjustable valve (77) configured to selectively permit the recirculation conduit to provide fluid communication between the exhaust conduit and the burner inlet;
- a NOx sensor located in the exhaust conduit (54), and
- a system controller (58) connected to the NOx sensor and configured to monitor an amount of NOx emissions in the exhaust conduit,
- the system controller is also connected to the valve to adjust the valve
- a digital microprocessor, or computer, with a memory and stored operating values as a system controller (i.e. – “The computer then stores these (two separate sets of ) values digitally” (see column 6, line 1).

**US005511971A (Benz et al)** shows and discloses (See column 5, line 56 – column 6, line 11) a method for a hydrocarbon fired burner including continuously measuring NOx, sending an NOx signal to a computer controller (58) that determines a command signal to control the solenoid operated recirculation damper (77).

**US005511971A (Benz et al)** discloses that a “computer”, which operates in response to computing the fraction of flue gas recirculated (FGR) by performing a mapping and storing function, “may shut down the boiler” when the unacceptable operating parameters are detected.

However, **US005511971A (Benz et al)** does not disclose:

- the NOx sensor is located upstream from the recirculation conduit;
- the controller operates to send a signal to the burner controller to “shut down”, notify or alarm maintenance personal when the NOx emissions in the exhaust conduit are at a first, or second, predetermined level.

**US005002484 (LOFTON et al)** teaches, from applicant’s the same flue gas recirculation field off endeavor, automatically shutting down a furnace unit when a comparison of monitored values demonstrates a low oxygen concentration indicative of substantial incomplete combustion (and therefore indicative of an undesirable level of NOx).

**US005539638A KEELER et al** teaches, from applicant’s same combustion emissions control field of endeavor, shutting down combustion operation rather than face high penalties of out-of-compliance operation (see column 1, line 56 – column 2, line 14).

In regard to claim 2, since the operation of a given burner system would depend on numerous design concerns such as the fuel type combusted, the overall size, shape and heat output of the combustor, etc., to place the NOx sensor is located upstream from the recirculation conduit can be viewed as nothing more than a mere matter of choice in design absent the showing of any new or unexpected results produce therefrom over the prior art reference of Bentz et al.

In regard to claims 1-3 and 5-9, for the purpose of preventing unsafe or damaging burner operation, to avoid high penalties and to provide suitable means for operating the control system, it would have been obvious to a person having ordinary skill in the art to provide the various system components set forth in the claims.

In regard to claims 5 and 8, whether the a predetermined level of NOx is at or above a “first” or “second” level to initiate either an alarm or valve adjustment can be viewed as nothing

more than merely a matter of choice in design and/or an obvious engineering design expedient absent the showing of any new or unexpected results produced therefrom.

**Claims 10, 11, 14-19 and 20-22: Rejected under 35 U.S.C. 103(a)**

Claims 10, 11, 14-19 and 20-22 are rejected under 35 U.S.C. 103(a) as being obvious over **US005511971A (Benz et al)** in view of **US005002484 (LOFTON et al)** (of record) and **US005539638A KEELER et al** (of record), or in view of **US006530207B2 (Tobo et al)** (newly cited).

**US005511971A (Benz et al)** shows and discloses a system for a hydrocarbon fired burner comprising:

- an exhaust conduit (54) in fluid communication with a burner (51);
- a recirculation conduit (59) configured to provide at least at times fluid communication between the exhaust conduit and burner inlet;
- an adjustable valve (77) configured to selectively permit the recirculation conduit to provide fluid communication between the exhaust conduit and the burner inlet;
- a NOx sensor located in the exhaust conduit (54), and
- a system controller (58) connected to the NOx sensor and configured to monitor an amount of NOx emissions in the exhaust conduit,
- the system controller is also connected to the valve to adjust the valve
- a digital microprocessor, or computer, with a memory and stored operating values as a system controller (i.e. – “The computer then stores these (two separate sets of) values digitally” (see column 6, line 1).

**US005511971A (Benz et al)** shows and discloses (See column 5, line 56 – column 6, line 11) a method for a hydrocarbon fired burner including continuously measuring NOx, sending

an NOx signal to a computer controller (58) that determines a command signal to control the solenoid operated recirculation damper (77).

**US005511971A (Benz et al)** discloses that a “computer”, which operates in response to computing the fraction of flue gas recirculated (FGR) by performing a mapping and storing function, “may shut down the boiler” when the unacceptable operating parameters are detected.

However, **US005511971A (Benz et al)** does not disclose:

- the NOx sensor is located upstream from the recirculation conduit;
- the controller operates to send a signal to the burner controller to “shut down”, notify or alarm maintenance personal when the NOx emissions in the exhaust conduit are at a first, or second, predetermined level.

**US005002484 (LOFTON et al)** teaches, from applicant’s the same flue gas recirculation field off endeavor, automatically shutting down a furnace unit when a comparison of monitored values demonstrates a low oxygen concentration indicative of substantial incomplete combustion (and therefore indicative of an undesirable level of NOx).

**US005539638A KEELER et al** teaches, from applicant’s same combustion emissions control field of endeavor, shutting down combustion operation rather than face high penalties of out-of-compliance operation (see column 1, line 56 – column 2, line 14).

**US006530207B2 (Tobo et al)** teaches (see column 7, lines 37-59), from applicant’s the same automatic gas burner control field off endeavor, automatically sounding a alarm in response to a first predetermined value (“The alarm signal calculation circuit 40 regards the output “e” from the first timer 48 as the normal signal of “1” (wherein the real NOx concentration value “a” is larger than the predicted NOx concentration value “b”) and shutting down a burner system when a comparison of monitored values representing NOx is at a second predetermined (“With respect to distinction between the shutdown and the alarm, the set value “2.epsilon.” of the second predetermined value setting element 51 of the shutdown calculation



circuit 41 is increased twice as much as the predetermined set value ".epsilon." of the first predetermined value setting element 46 of the alarm signal calculation circuit 40.)”).

In regard to claims 10, 11, 14-19 and 20-22, for the purpose of preventing unsafe or damaging burner operation, to avoid high penalties and to provide suitable means for operating the control system, it would have been obvious to a person having ordinary skill in the art to provide the various system components set forth in the claims, in view of the teachings of **US005002484 (LOFTON et al)** and **US005539638A KEELER et al**. In regard to claims 10, 11, 14-19 and 20, whether the a predetermined level of NO<sub>x</sub> is at or above a “first” or “second” level to initiate either an alarm or valve adjustment can be viewed as nothing more than merely a matter of choice in design and/or an obvious engineering design expedient absent the showing of any new of unexpected results produced therefrom.

Alternatively, in regard to claims 10, 11, 14-19 and 20-22, for the purpose of preventing unsafe or damaging burner operation, to avoid high penalties and to provide suitable means for operating the control system, it would have been obvious to a person having ordinary skill in the art to provide the various system components set forth in the claims, including initiating either an alarm or valve adjustment dependant on separate sensed values of NO<sub>x</sub>, in view of the teachings of **US006530207B2 (Tobo et al)**.

### **Conclusion**

See the attached USPTO form 892 for prior art made of record and not relied upon which is considered pertinent to applicant's disclosure.

### **THIS ACTION IS MADE FINAL**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

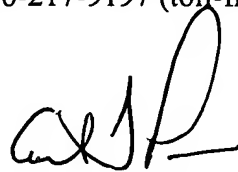
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

**USPTO CUSTOMER CONTACT INFORMATION**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CARL D. PRICE whose telephone number is (571) 272-4880. The examiner can normally be reached on Monday through Friday between 6:30am-3:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ehud Gartenberg can be reached on (571) 272-4828. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



CARL D. PRICE  
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Art Unit 3749